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SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

DIRECTIONS FOR COLLECTING, PREPARING, AND
PRESERVING BIRDS' EGGS AND NESTS.

BY

CHARLES BENDIRE,

Honorary Curator of the Department of Oölogy.

Part D of Bulletin of the United States National Museum, No. 39.

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In making a collection of nests and eggs, it is of the utmost importance that the identification of all specimens taken should be absolutely correct. The only sure way to accomplish this is to secure the parent at the same time. This should at least be done with all the less known and rarer birds, and continued until the collector is thoroughly familiar with the breeding habits, nesting sites, and eggs of the species in question.

Unless the would-be collector intends to make an especial study of oölogy and has a higher aim than the mere desire to take and accumulate as large a number of specimens as possible regardless of their proper identification, he had better not begin at all, but leave the nests and eggs of our birds alone and undisturbed. They already have too many enemies to contend with, without adding the average egg-collector to the number. The mere accumulation of specimens is the least important object of the true oölogist. His principal aim should be to make careful observations on the habits, call notes, song, the character of the food, mode and length of incubation, and the actions of the species generally from the beginning of the mating season to the time the young are able to leave the nest. This period comprises the most interesting and instructive part of the life history of our birds.

Do not start in with the idea that because a certain species may be common with you everything must consequently already be known about it, and that your observations would be useless. Rest assured that some new and interesting fact can still be learned by the observant oölogist about even our commonest birds.

A small, thoroughly identified, well prepared, and neatly cared for collection, even if only a local one, is worth far more scientifically and in every other way than a more extensive one obtained by exchange or purchase. One of the most important matters is the preparation of the specimens. Eggs, when first taken and before blowing them, should as far as practicable have all stains and dirt on the shells wiped or washed off. Care must be taken, however, not to scrub the shell too much or too hard, as such treatment may result in breaking the specimen or injury to the coloring matter, which in many species is not

thoroughly fixed in a fresh-laid egg. This applies especially to the eggs of many game birds and hawks, as well as to others. The shells of some of the water birds, as the Pelicans, Gannets, and Cormorants, are covered with a more or less uneven deposit of lime. This should not be scraped or scrubbed off. Especial care should be taken to thoroughly clean all white eggs both inside and outside, particularly those of Woodpeckers.

Eggs should be blown or emptied through a *single* small hole neatly drilled on one side, as shown in the figure on page 8. It is well to commence making this hole with a needle and finishing it with an egg drill, which is given a rotary motion between the thumb and forefinger. In marked or spotted eggs the poorest or least marked side should always be selected for this purpose. Great care should be taken to remove the entire contents.

A simple blowpipe and a few different sized drills, like those figured below, which may be obtained at any natural-history dealer's establishment, are all the implements required to blow an egg.



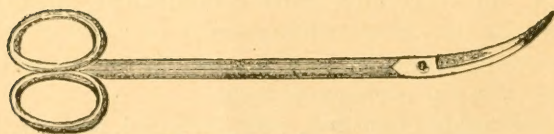
Drills.



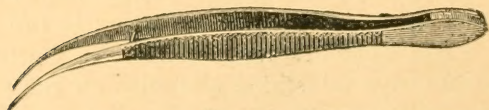
Blowpipe.



Embryo hook.



Curved pointed scissors.



Tweezers.

Many collectors use very fine glass points attached to a rubber bulb, others use an instrument manufactured by Mr. E. W. Ellsworth, of East

Windsor Hill, Connecticut, which, although somewhat more expensive, is one of the best egg-blowers known to me. A short blowpipe like the above, with a rubber tube about 3 feet in length and a horn mouth-piece attached, makes a very satisfactory instrument for general use.

To blow an egg.—Drill a small hole on the side and in the center of the egg, insert the tip of the blowpipe for a very short distance, and remove the contents as far as this can readily be done. In fact an egg can be blown without inserting the point at all, simply holding it close up to the hole and forcing air through it. Should the albumen be thick or stringy, and not run out freely while blowing the egg, push aside such parts as may be forced out of the hole with the end of the blowpipe or a small pair of forceps, and shake the egg; this will facilitate matters. Small portions of the albumen and yolk of the egg will usually remain in the shell, and this is best removed by forcing water into the egg with a small syringe, holding the point of the latter *over* the hole and an inch from it. This will always allow a part of the water to enter. When about half full shake the egg, holding it between the fingers, and then blow out the contents. If the water does not come out perfectly clear repeat the process until it does. Eggs that have been thoroughly cleaned will retain their original color much better, and insects or mice are not so apt to injure them. After the egg has been cleaned it should be put away, hole downward, and allowed to drain. The best material to place an egg on to absorb whatever moisture may remain in it after cleaning, is corn meal. Particles of this substance that may remain sticking about the hole of the egg are easily removed by a slight touch of the fingers. I find coarse corn meal to be by far the best article to drain eggs on, as it will not stick tightly and is always readily removed; the danger of chipping small pieces of the shell around the edges of the hole, which often happens where blotting paper or fine sawdust are used for this purpose, is in this way reduced to a minimum.

In cases where eggs are nearly hatched when found, excepting very small and thin-shelled ones, which beyond a certain stage can not readily be saved, and should not under such circumstances be disturbed, drill a slightly larger hole in the shell and puncture or lacerate the embryo with a needle or a sharp embryo hook. Care must be taken not to run the instrument through the opposite side of the egg. Then try to force out such of the contents, consisting of fluid portions and parts of the yolk, which have not been entirely absorbed by the embryo. This may be accomplished either by the blowpipe or, perhaps, more readily by holding the point of a small syringe, filled with water, directly over the hole and about an inch from it, and forcing a steady stream of water into the egg. Never insert the point of the syringe directly in the hole, unless you wish to burst the egg. Do not attempt to force out too much in the beginning. After getting out some of the softer contents of the egg, fill it with the water, wipe it dry and clean and put

the specimen so treated in a covered box, in which you have first placed a layer of corn meal about an inch in depth. The object of this treatment is to allow the water injected to come in contact with the more tender parts of the embryo and to accelerate decomposition. In order to remove the contents through a small hole, these must be allowed to decompose. A strong solution of Caustic Potash injected as before stated accelerates matters, reducing the embryo to a soft soapy mass, and such treatment does not injure the shell of the egg. Next place the box, after closing the lid, in a warm place, either in the sun or under a stove, and let it remain undisturbed for about 48 hours. Repeat this operation two or three times, always assisting the removal of any small particles which may be forced out of the hole by cutting such away with a thin-bladed pair of scissors; curved pointed ones are the best for this purpose. Do not try to pull the embryo out, nor to empty the egg at one operation; use a little patience, and in this manner most far-advanced eggs can be emptied through a reasonably small aperture. The egg should be refilled with fresh water after each operation. Do not try to take the inner lining of the shell out, in case it becomes detached during the rotting process; it does no harm by remaining, while the chances are that you will break the egg, which is naturally much weakened without this skin, if you attempt to remove it. Occasionally a collector may obtain rare unblown specimens in which the contents have completely dried up and hardened, and it may puzzle him how to empty such eggs. Unless they contained large embryos when first found, or when abandoned by the parents, they may easily be blown by the following directions:

Take common bicarbonate of soda, dissolve about 3 tablespoonfuls to a pint of water and simply inject this solution in the egg and treat as previously mentioned. Repeat this once or twice at intervals of 48 hours and you will probably have no great difficulty in emptying your specimens through a moderately small hole, and the shell will not be injured by this solution.

In blowing small and delicate eggs, I find the use of an egg-holder of considerable assistance, and consider this mode of holding a small egg much safer and far more convenient than taking the specimen between the tips of the fingers. To make one, take a piece of thin wire, say from 6 to 8 inches long, bend both ends in the shape of a circular loop of the required size, again bend the wire exactly in the center, so that the loops face each other somewhat like a pair of sugar tongs, and you have a holder. The wire used should be springy and elastic, so that it will readily give somewhat and hold the egg securely, but not too tightly at the same time. Brass wire answers the purpose very well.

It is always preferable to blow eggs at home, or after returning to camp. You have usually better facilities then to do your work neatly than in the field, where one is apt to be in a hurry, and often to have no water to rinse the inside of the eggs thoroughly after blowing them.

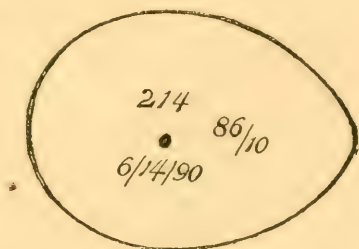
This is positively necessary to insure good clean specimens. I found an old flat piece of sponge, say about 2 inches thick by from 4 to 6 inches wide and long, placed in a tin basin partly filled with water to soften and saturate it, very handy during the operation of blowing eggs. The sponge forms a convenient and elastic cushion for the eggs to rest on, while I injected with water to rinse the inside thoroughly, and should one drop out of the egg-holder the chance of breakage is small. The coarse kind of bathing sponge is best, lasts for years, and can easily be kept clean and sweet.

For packing unblown eggs while out in the field I find small boxes (cigar boxes will answer the purpose very well), fitted with different sized subdivisions, very convenient. Each of these small partitions may be lined with open cylinders made of blanket or heavy cloth. They may be from 2 to 4 inches long, according to the depth of the box, and from 1 to 2 inches in diameter, according to the sizes of the eggs one may expect to find. The bottom of the box should be extra well lined with either sheet cotton, cloth, or blanket cut the required size to fit this closely all around, on which the frame forming the subdivisions is then placed. A piece of heavy cloth or blanket, cut to fit, is placed on the open top of the box, or it may be glued to the lid. The sides of the different partitions are lined by the cylinders already mentioned, each forming thus a little compartment of its own, avoiding all pressure from the contents of the others, and each of these should be provided with some extra cotton. One or two eggs may then be placed in each cylinder, with cotton on top and between them, to keep them from moving around, and if the eggs are of small size sets of four may be placed together, but in such a case each egg must be wrapped in cotton separately. Under no circumstances should the eggs be put in loose, with the shells touching each other. Placed in this way, some are sure to be either cracked or broken. If the eggs are of fair size more than two should never be put in the same compartment, as their combined weight might crush the lower ones. With ordinary care and packed as above (rail and unblown eggs will nevertheless stand considerable jolting).

Many rare and valuable specimens are also lost through improper packing when sent by mail or express; by observing the following rules, such losses may be to a great extent avoided. Egg-shells, even after having been blown, should (during transit, at least) never touch each other. Each egg should be wrapped separately in cotton, and they should not be packed too close. In sending eggs through the mail, they should be packed in stout wooden boxes, the box being first lined with cotton all around and the eggs placed in afterwards, rather loosely, each egg wrapped in cotton by itself. Tin boxes are not as good as wooden ones. Cigar boxes answer well, provided they are partitioned off through the middle, to prevent the lid being crushed in on top of the eggs, which often happens where this precaution is not taken.

Each setting, clutch, or the full complement of eggs, usually called a "set," should at once after finding them be marked, temporarily at least, so that in case several sets of eggs of the same species are taken at the same time, each individual set may be readily separated from others of the same kind.

In marking eggs permanently, I consider the following a good way: Eggs should be marked with a soft pencil in preference to anything else, as these marks can always be washed off clean, when it is desirable to do so, which can not be done when certain inks are used. A good way is to place the catalogue number of the eggs on one side of the hole, and the set number and number of the eggs contained in the set on opposite sides. The date of collecting can, if desired, be placed below, and it is well to mark this on at least one egg of each set. For example, I desire to mark a set of ten eggs of the Sora Rail, *Porzana carolina* (Linn.), taken June 14, 1896. The check list published by the American Ornithologists Union, is most generally used at present, and I use its numbers in this case. The Sora Rail stands number 214 on this list, and I mark the eggs of the set as follows:



No. 214 is the A. O. U. check list number of this species. No. 86 the running number of the set No. 10 indicates the number of eggs in the set.

and the numbers below the hole, which need only be put on a single specimen in each set, indicate the date. The next set would also be 214 if of the same species, but the running or current number in this case would be 87, followed below by the number of eggs the set contained. Aside from this a regular record should be kept for each set of eggs taken.

Many collectors use regular blank forms for this purpose, which are carefully filed away. A good sample of such a blank is about 6 inches square, printed on a good quality of paper, and these may be kept like the card catalogues generally in use in libraries.

These blanks may be printed as follows:

Oölogical collection of ———. Current No. ———.

A. O. U. check list No. ———. Date ———.

Name { Scientific ———.
 { Common ———.

No. of eggs in set ———. Set mark ———.

Identification ———. Incubation ———.

Locality ——— ———.

Nest diameter, outside, — inches; inside, — inches.

Nest depth, outside, — inches; inside, — inches.

Nest composed of ———.

Situation of nest ———.

No. of parent ———. Collector ———.

On a blank of this size, everything of interest can be readily noted, using the reverse side also, if more space for details is required.

A small printed blank (those used in the U. S. Nat. Museum collection measure $2\frac{1}{4}$ by $1\frac{1}{4}$ inches, but can be made still smaller if desired) should also be kept with each set of eggs in addition to the above.

This should give the following information :

Oölogical collection of ———.

Current No. ———. Set No. ———.

Scientific name ———.

Collector ———. Date ———.

The marks on both blanks should correspond with those on the set of eggs in question.

Aside from keeping the data previously mentioned, it is well to keep a regular record book with an index, in which to note down anything of interest relating to every species observed, such as, in the case of migrants, the dates of their first arrival in the spring, the date when last seen in the fall, the localities most frequented by each species, their various call notes, notes of alarm, and song, the contents of the stomachs of such specimens as are shot, and their relative abundance, in fact everything of general interest. Field notes should be written on one side of the paper only. Unblown eggs, a part of whose shells have been indented, may be restored to their natural shape by first drilling a hole on the same side of the egg, where the injury is located, but a little distance away from this if possible. Then insert the blowpipe in the hole and force air gently in the egg; as soon as the indentation has disappeared and the shell has taken its natural shape, take a camel's hair brush dipped in collodion and cover the injured surface of the egg with a small quantity, place the specimen away until the collodion has hardened, then finish blowing it. Eggs which have been cracked before blowing, or during the process, may be treated in the same manner, as well as broken specimens.

The best way to collect and preserve nests is not to detach or lift them from their immediate surroundings, but to leave them in their natural positions, cutting off the branches, if placed in a tree or shrub, a couple of inches or more above and below the nest. In this way they can be much better preserved in their original shape and are less liable to injury. Nests of the ground-building species should have a thin section of the sod on which they are placed taken up and preserved with them. The inner cavity of each nest should be filled with a ball of soft paper, old newspapers answer the purpose very well, or old cotton wrapped in tissue paper and tied in place. This assists materially in preserving

the exact contour of the nest mold, especially where from want of space a number are packed on top of each other. Where the inner lining of nests consists principally of feathers or fur, a small quantity of naphthaline should be sprinkled among them to keep moths and insects away; otherwise many interesting specimens are soon destroyed by such pests. The nest belonging to each set of eggs should be labeled similarly and the label attached to the side of the nest. Many collectors keep each set of eggs in the respective nests, but, unless the collection is a small one and excellent care is taken of it, this is not advisable, as many nests are more or less damp when taken and are apt to become moldy, affecting the eggs in a like manner.

It is not the intention to give instructions through this circular just where to look for the nests of our birds. An observant oölogist can soon find out the different modes of nidification by watching the species found in his vicinity.



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